

REMARKS

The specification has been amended to correct multiple spelling errors and minor informalities. The Abstract of the Disclosure has been amended to comply with MPEP § 608.01(b). The present amendment obviates the Examiner's objections to the specification and abstract.

Claim 3 has been cancelled without prejudice. Independent claim 2 has been amended to incorporate the subject matter of claim 3. Furthermore, claim 2 has been amended to improve grammar and clarity. In particular, the preamble of claim 2 has been amended to recite "casting a profile portion of a supercharger rotor to surround a shaft" as supported on page 14, lines 13-20, of the specification as originally filed. New claim 6, which depends upon claim 2, has been added to recite additional subject matter as supported on page 12, lines 7-11, and on page 14, lines 4-7, of the specification as originally filed. New claim 7, which depends upon claim 6, has been added to recite additional subject matter supported on page 12, line 21, to page 13, line 10, and on page 14, lines 13-27, of the specification as originally filed.

The present amendment does not add any new matter to the application.

The Invention

The present invention pertains generally to a method for manufacturing a supercharger rotor. More particularly, in a first embodiment in accordance with the present invention, a method for manufacturing a supercharger rotor by casting a profile portion of a supercharger rotor to surround a shaft penetrating the profile portion is provided that includes the steps recited in claim 2. Various other embodiments of the method are recited in the dependent claims.

All of the method embodiments, in accordance with the present invention, include the step of “cutting a left and right helical cross portion on a surface of the shaft,” which advantageously provides an improved bonding strength per axial length between the shaft and the profile portion. In fact, this improved bonding strength is at least 38% stronger than what has been conventionally obtained (See Figure 7, and page 15, lines 22-27, of the present disclosure).

The Rejection

Claims 2 and 3 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite.

Claims 2 and 3 also stand rejected under 35 U.S.C. § 103(a) as unpatentable over Timuska et al. (U.S. Patent 4,761,124) in view of Miyashita (U.S. Patent 4,224,727).

Applicants respectfully traverse the rejection and request reconsideration of the application for the following reasons.

Applicants' Arguments

In view of the present amendment, claims 2 and 6 are now in compliance with 35 U.S.C. § 112, second paragraph. In addition, Applicants respectfully traverse the Examiner's contention that the phrase “cross portion” recited in claim 2 is indefinite. It is well established that the use of new terminology in a disclosure does not render claims indefinite so long as the new terminology is defined. In re Fisher, 166 U.S.P.Q. 18, 23 (C.C.P.A. 1970). Furthermore, the Federal Circuit has ruled that the law permits a patentee to act as his own lexicographer and to ascribe a certain meaning to a claim term. Digital Biometrics Inc. v. Identix Inc., 47 U.S.P.Q.2d 1418, 1424 (Fed. Cir. 1998).

In the present case, Applicants point out that claim 2 actually recites “a left and right helical cross portion,” such as is supported on page 7, lines 1-9, of the specification and as is

shown in Figure 5A of the disclosure as originally filed. Applicants assert, in view of the adequate support from the disclosure, the claim term “a left and right helical cross portion” is definite and no amendment of this patent term is warranted.

The Rejection Under 35 U.S.C. § 103

A patentability analysis under 35 U.S.C. § 103 requires (a) determining the scope and content of the prior art, (b) ascertaining the differences between the prior art and the claimed subject matter, (c) resolving the level of ordinary skill in the pertinent art, and (d) considering secondary considerations that may serve as indicia of nonobviousness or obviousness. Graham v. John Deere Co. of Kansas City, 148 U.S.P.Q. 459, 467 (1966). Furthermore, a proper rejection under Section 103 further requires showing (1) that the prior art would have suggested to a person of ordinary skill in the art that they should make the claimed device or carry out the claimed process, (2) that the prior art would have revealed to a person of ordinary skill in the art that in so making or doing, there would have been a reasonable expectation of success, and (3) both the suggestion and the reasonable expectation of success must be found in the prior art and not in the applicants’ disclosure. In re Vaeck, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991).

The Timuska Patent

U.S. Patent 4,761,124 to Timuska et al. (hereafter, the Timuska Patent) teaches a “screw-type rotary machine having at least one rotor made of a plastics material,” which includes a female rotor (1) and a male rotor (2) as shown in Figure 1. The female rotor (1) has helically extending lands (3) and intermediate grooves (4), and the male rotor (2) has helically extending lands (5) and grooves (6). The female rotor (1) comprises a plastics part (7) moulded on a steel shaft (8) by injection moulding (col. 2, lines 55-58), whereas the male

rotor (2) is made of aluminum or steel, or is made of extruded aluminum or plastics (col. 2, lines 59-61).

The Timuska Patent gives little instruction as to how the male rotor (2) is manufactured, and teaches that the female rotor (1) is manufactured by injection moulding (col. 3, lines 22-49). The purpose of injection moulding the female rotor (1) is so that the “surface smoothness is fine enough to make subsequent finishing unnecessary” yet damages caused by a lack of machining are still avoided (See Abstract).

As admitted by the Examiner (Office Action dated July 21, 2004, page 4, lines 20-21), the Timuska Patent does not teach, or even suggest, “cutting a left and right helical cross portion on a surface of the shaft” as recited in claim 2. In fact, the Timuska Patent teaches away from “subsequent finishing” of the female rotor (1) after it has been moulded. The Timuska Patent also does not teach, or even suggest, that “a plurality of cutting tools are used in parallel in lathe work, and multiple thread screws are simultaneously cut” as recited in claim 6, and that “casting the profile portion includes surrounding the cross portion of the shaft with a metal mold so the cross portion is disposed inside a cavity of the mold, and attaching a helical core inside the cavity of the mold so the profile portion cast includes a hollow portion formed in the profile portion” as recited in claim 7.

The Miyashita Patent

U.S. Patent 4,224,727 to Miyashita (hereafter, the Miyashita Patent) teaches a “method of making the body of a hydraulic master cylinder,” such as would be used in a automobile, motorcycle or other vehicle (col. 1, lines 1-10). As shown in Figure 6, the inner body section (1) of cylinder body (b) of the “assembly of a brake master cylinder” includes ridges (1a) formed as a diamond or double helical knurls on the inner body section by knurling (col. 3, lines 47-49). The Miyashita Patent teaches that the ridges have only a

limited heat capacity and are formed to help the inner body section (1) fuse together with the outer body section (2), (col. 3, lines 50-56). The Miyashita Patent does not teach, or even suggest, “cutting a left and right helical cross portion on a surface of the shaft” as recited in claim 2. The Miyashita Patent also does not teach, or even suggest, that “a plurality of cutting tools are used in parallel in lathe work, and multiple thread screws are simultaneously cut” as recited in claim 6, and that “casting the profile portion includes surrounding the cross portion of the shaft with a metal mold so the cross portion is disposed inside a cavity of the mold, and attaching a helical core inside the cavity of the mold so the profile portion cast includes a hollow portion formed in the profile portion” as recited in claim 7.

In view of the teachings of the Timuska Patent and the Miyashita Patent, the Examiner’s Section 103 rejection is untenable and must be withdrawn for multiple reasons. First, neither the Timuska Patent nor the Miyashita Patent teach, or even suggest, “cutting a left and right helical cross portion on a surface of the shaft” as recited in claim 2. On the contrary, the Timushka Patent teaches away from cutting the smooth surface of the female rotor. Second, the Miyashita Patent teaches forming ridges as double helical knurls via knurling, and does not teach forming ridges by cutting.

Thirdly, neither the Timuska Patent nor the Miyashita Patent teach, or even suggest, that “a plurality of cutting tools are used in parallel in lathe work, and multiple thread screws are simultaneously cut” as recited in claim 6, and that “casting the profile portion includes surrounding the cross portion of the shaft with a metal mold so the cross portion is disposed inside a cavity of the mold, and attaching a helical core inside the cavity of the mold so the profile portion cast includes a hollow portion formed in the profile portion” as recited in claim 7.

Conclusion

Claims 2, 6 and 7 are now in compliance with 35 U.S.C. § 112 in view of the present amendment. In addition, the rejection under 35 U.S.C. § 103(a) is untenable and must be withdrawn because neither the Timuska Patent nor the Miyashita Patent teach, or even suggest, the step of ““cutting a left and right helical cross portion on a surface of the shaft” as recited in claim 2.

For all of the above reasons, claims 2, 6 and 7 are believed to be in condition for allowance, and a prompt notice of allowance is earnestly solicited. Questions are welcomed by the below-signed attorney for Applicants.

Respectfully submitted,

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